

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY



(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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|---|---|---|-----------------------|
| Applicant's or agent's file reference PH-21691-PCT | FOR FURTHER ACTION | | See Form PCT/IPEA/416 |
| International application No. PCT/KR2004/001874 | International filing date(day/month/year) 26 JULY 2004 (26.07.2004) | Priority date (day/month/year) 26 JULY 2003 (26.07.2003) | |
| International Patent Classification (IPC) or national classification and IPC IPC7 C07D 487/04 | | | |
| Applicant POSTECH FOUNDATION et al | | | |

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
- a. ☐ (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:
- ☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
- ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
- b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____ containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:
- ☒ Box No. I Basis of the report
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

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| Date of submission of the demand 14 FEBRUARY 2005 (14.02.2005) | Date of completion of this report 23 NOVEMBER 2005 (23.11.2005) |
| Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140 | Authorized officer LEE, Jae Jeong Telephone No. 82-42-481-5604  |

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/001874

Box No. 1 Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☒ This report is based on translations from the original language into the following language English which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3 and 23.1(b))
 - ☒ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
 - ☒ the international application as originally filed/furnished
 - ☐ the description:
 - pages _____ as originally filed/furnished
 - pages* _____ received by this Authority on _____
 - pages* _____ received by this Authority on _____
 - ☐ the claims:
 - pages _____ as originally filed/furnished
 - pages* _____ as amended (together with any statement) under Article 19
 - pages* _____ received by this Authority on _____
 - pages* _____ received by this Authority on _____
 - ☐ the drawings:
 - pages _____ as originally filed/furnished
 - pages* _____ received by this Authority on _____
 - pages* _____ received by this Authority on _____
 - ☐ the sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:
 - ☐ the description, pages _____
 - ☐ the claims, Nos. _____
 - ☐ the drawings, sheets _____
 - ☐ the sequence listing (*specify*): _____
 - ☐ any table(s) related to sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 - ☐ the description, pages _____
 - ☐ the claims, Nos. _____
 - ☐ the drawings, sheets _____
 - ☐ the sequence listing (*specify*): _____
 - ☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

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Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,☒ claims Nos. 4 - 7, 9 - 12

because:

☐ the said international application, or the said claims Nos. _____
relate to the following subject matter which does not require an international preliminary examination (*specify*):☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. _____
are so unclear that no meaningful opinion could be formed (*specify*):☒ the claims, or said claims Nos. 4 - 7, 9 - 12 are so inadequately supported
by the description that no meaningful opinion could be formed.☒ no international search report has been established for said claims Nos. 4 - 7, 9 - 12☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the
Administrative Instructions in that:

the written form

☐

has not been furnished

☐

does not comply with the standard

the computer readable form

☐

has not been furnished

☐

does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with
the technical requirements provided for in Annex C-bis of the Administrative Instructions.☐ See Supplemental Box for further details.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/001874

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

| | | | |
|-------------------------------|--------|----------|-----|
| Novelty (N) | Claims | 1 - 3, 8 | YES |
| | Claims | | NO |
| Inventive step (IS) | Claims | 1 - 3, 8 | YES |
| | Claims | | NO |
| Industrial applicability (IA) | Claims | 1 - 3, 8 | YES |
| | Claims | | NO |

2. Citations and explanations (Rule 70.7)

Reference is made to the following documents:

D1: WO 0068232 A1 (UNISEARCH LIMITED) 16 NOV. 2000
D2: WO 02096553 A2 (SYNTEC GESELLSCHAFT FUR CHEMIE UND TECHNOLOGIE DER INFORMATIONSAUFZEICHNUNG MBH) 05 DEC. 2002
D3: WO 03004500 A1 (POSTECH FOUNDATION) 16 JAN. 2003
D4: WO 03024978 A1 (POSTECH FOUNDATION) 27 MARCH 2003
D5: WO 03055888 A1 (POSTECH FOUNDATION) 10 JULY 2003
D6: SAMSONENKO et. al. "Synthesis and crystal structure of the nanosized supramolecular SmIII complex with macrocyclic cavitand cucurbituril" In: Russian Chemical Bulletin, 2002, 51(10), p.1915-1918

The present invention relates to nanoparticles prepared by the aggregation of cucurbituril derivatives and preparation methods thereof.

D1 discloses a method for producing cucurbit[n]urils, where n is from 4 to 12. Novel cucurbit[n]urils and substituted cucurbit[n]urils are also described. D2 relates to novel inorganic absorbent composites consisting of an open pore, solid and inorganic matrix, comprising cucurbiturils which are chemically linked in the matrix. D3 provides cucurbituril derivatives which have enhanced solubility in common solvents. D4 provides an inclusion compound having a cucurbituril derivative as a host molecule and a metal complex as a guest molecule. A pharmaceutical composition having an anticancer effect can be obtained by using the inclusion compound. D5 provides hydroxycucurbituril derivatives which are easy to further functionalize with enhanced solubility in common solvents. D6 describes a nanosized supramolecular SmIII complex with macrocyclic cucurbituril, and its crystal and molecular structure are established by x-ray diffraction analysis.

Although D1-D6 teach the process for preparing and using various cucurbituril derivatives, D1-D6 do not disclose the features of the subject matter of claims 1 - 3 and 8, which meet the criteria set forth in PCT Article 33(2), (3) and (4). The nanoparticles prepared by cucurbituril derivatives are not anticipated by any of the references on record.

Thus, the invention described in the present application is considered to be novel, inventive and industrially applicable.